

CPC**COOPERATIVE PATENT CLASSIFICATION****B60C**

VEHICLE TYRES ([manufacture B29](#)); **TYRE INFLATION; TYRE CHANGING OR REPAIRING; REPAIRING, OR CONNECTING VALVES TO, INFLATABLE ELASTIC BODIES IN GENERAL; DEVICES OR ARRANGEMENTS RELATED TO TYRES** ([testing of tyres G01M 17/02](#))

NOTE

In this subclass, the term "tyre" is to be understood as a separate ground-engaging, continuous element outside the periphery of the wheel rim and includes the tyre casing, cover, or jacket and any insert, e.g. inner tube. In the groups relating to repair or connection of valves, the term "tyre" is to be understood to include also inflatable elastic bodies other than tyres or inner tubes

Attention is drawn to the note following the title of class B 60.

WARNING

[C2012.04]

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[B60C 11/113](#) covered by [B60C 11/08](#)
[B60C 11/117](#) covered by [B60C 11/03](#)

B60C 1/00

Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition

NOTE

Tyres characterised by compositions only, i.e. having no significant tyre structure, are classified only with the compositions, e.g. [C08K](#), [C08L](#)

B60C 1/0008

. {Compositions of the inner liner}

B60C 1/0016

. { Compositions of the tread}

B60C 1/0025

. {Compositions of the sidewalls}

B60C 1/0041

. { Compositions of the carcass layers}

B60C 3/00

Tyres characterised by the transverse section ([characterised by rail-engaging elements B60B 17/00](#))

B60C 3/02

. Closed, e.g. toroidal, tyres

- B60C 3/04 . characterised by the relative dimensions of the section, e.g. low profile ([B60C 3/06](#) takes precedence)
- B60C 3/06 . Asymmetric
- B60C 3/08 . collapsible into storage or non-use condition, e.g. space-saving spare tyres (run-flat tyres [B60C 17/08](#))

- B60C 5/00** **Inflatable pneumatic tyres or inner tubes** ([B60C 1/00](#), [B60C 9/00](#) to [B60C 17/00](#) take precedence)

- B60C 5/001 . {filled with other gas than air}
- B60C 5/002 . {with more than one compartment (tyres with at least two inflatable inserts separated by a part of the tyre [B60C 5/025](#); tubeless tyres with diaphragm [B60C 5/125](#))}
- B60C 5/004 . {made from other material than rubber}
- B60C 5/005 . . {from leather}
- B60C 5/007 . {made from other material than rubber}
- B60C 5/008 . {partially filled with foam material}
- B60C 5/01 . without substantial cord reinforcement, e.g. cordless tyres, cast tyres
- B60C 5/02 . having separate inflatable inserts, e.g. with inner tubes; Means for lubricating, venting, preventing relative movement between tyre and inner tube ([B60C 5/20](#) takes precedence)
- B60C 5/025 . . {tyre with at least two inflatable inserts separated by a part of the tyre (inflatable inserts with several inflatable chambers [B60C 5/20](#))}
- B60C 5/04 . . Shape or construction of inflatable inserts ([B60C 5/10](#) takes precedence)
- B60C 5/08 . . . having reinforcing means
- B60C 5/10 . . . formed as a single discontinuous ring with contiguous ends which may be connected together

- B60C 5/12 . without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim ([B60C 5/20](#) takes precedence)
- B60C 5/14 . . with impervious liner or coating on the inner wall of the tyre ([B60C 21/04](#), [B60C 21/08](#) take precedence)
- B60C 5/142 . . . { provided partially, i.e. not covering the whole inner wall}
- B60C 5/16 . . Sealing means between beads and rims, e.g. bands

- B60C 5/18 . Sectional casings, e.g. comprising replaceable arcuate parts

- B60C 5/20 . having multiple separate inflatable chambers (with additional tubes which become load supporting in emergency [B60C 17/02](#))
- B60C 5/22 . . the chambers being annular
- B60C 5/24 . . the walls of the chambers extending transversely of the tyre

B60C 7/00 **Non-inflatable or solid tyres** ([B60C 1/00](#) takes precedence; tyres or rims characterised by rail engaging elements [B60B 17/00](#))

- B60C 7/02 . made from ropes or bristles
- B60C 7/04 . made of wood or leather
- B60C 7/06 . made of metal
- B60C 7/08 . built-up from a plurality of arcuate parts
- B60C 7/10 . characterised by means for increasing resiliency ([highly resilient wheels B60B 9/00](#))
- B60C 7/102 .. { Tyres built-up with separate rubber parts}
- B60C 7/105 .. {using foam material}
- B60C 7/12 .. using enclosed chambers, e.g. gas-filled ([inflatable tyres B60C 5/00](#))
- B60C 7/125 ... {using enclosed chambers, e.g. gasfilled, between two rims or between a rim and a tread}
- B60C 7/14 .. using springs
- B60C 7/143 ... { having a lateral extension disposed in a plane parallel to the wheel axis}
- B60C 7/16 ... of helical or flat coil form
- B60C 7/18 disposed radially relative to wheel axis
- B60C 7/20 disposed circumferentially relative to wheel axis
- B60C 7/22 . having inlays other than for increasing resiliency, e.g. for armouring
- B60C 7/24 . characterised by means for securing tyres on rim or wheel body
- B60C 7/26 .. using bolts
- B60C 7/28 .. using straps or the like, e.g. vulcanised into the tyre

B60C 9/00 **Reinforcements or ply arrangement of pneumatic tyres** (inserts having reinforcing means [B60C 5/08](#); bead structure, e.g. turnup or overlap construction, [B60C 15/00](#); tyre cords per se [D02G 3/48](#); fabrics per se [D03D](#), [D04H](#); metal ropes or cables per se [D07B 1/06](#)){ B}

NOTE

When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned

- B60C 9/0007 . { Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal}
- B60C 9/0028 . { Reinforcements comprising mineral fibres, e.g. glass or carbon fibres}
- B60C 9/0042 . { Reinforcements made of synthetic materials}
- B60C 9/005 . { Reinforcements made of different materials, e.g. hybrid or composite cords}

- B60C 9/0057 . { Reinforcements comprising preshaped elements, e.g. undulated or zig-zag filaments}
- B60C 9/0064 . { Reinforcements comprising monofilaments}
- B60C 9/02 . Carcasses
- B60C 9/0207 .. { Carcasses comprising an interrupted ply, i.e. where the carcass ply does not continuously extend from bead to bead but is interrupted, e.g. at the belt area, into two or more portions of the same ply}
- B60C 9/023 .. { with special relationship between carcass layers and between carcass layers and the other reinforcing inlays in the bead region}

WARNING

Group [B60C 9/023](#) is from 1 February 1988 no longer being used for the classification of new documents

Documents from the backlog of [B60C 9/023](#) are in the process of being systematically transferred to [B60C 15/00](#)

- B60C 9/0238 .. { characterised by special physical properties of the carcass ply}
- B60C 9/0292 .. { Carcass ply curvature (**sidewall curvature** [B60C 13/003](#))}
- B60C 9/04 .. the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
- B60C 9/06 ... the cords extend diagonally from bead to bead and run in opposite directions in each successive carcass ply, i.e. bias angle ply ([B60C 9/07](#), [B60C 9/09](#) take precedence)
- B60C 9/07 ... the cords curve from bead to bead in plural planes, e.g. S-shaped cords
- B60C 9/08 ... the cords extend transversely from bead to bead, i.e. radial ply ([B60C 9/07](#) takes precedence)
- B60C 9/09 combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply
- B60C 9/10 .. the reinforcing cords within each carcass ply arranged in a crossing relationship
- B60C 9/11 ... Woven, braided, or knitted plies
- B60C 9/12 .. built-up with rubberised layers of discrete fibres or filaments
- B60C 9/13 ... with two or more differing cord materials
- B60C 9/14 .. built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
- B60C 9/16 .. built-up with metallic reinforcing inlays
- B60C 9/17 .. asymmetric to the midcircumferential plane of the tyre
- B60C 9/18 . Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers
- B60C 9/1807 .. { comprising fabric reinforcements}
- B60C 9/1821 .. { comprising discrete fibres or filaments}
- B60C 9/1835 .. { Rubber strips or cushions at the belt edges (**compositions** [B60C 1/00N2](#))}
- B60C 9/185 ... { between adjacent or radially below the belt plies}
- B60C 9/20 .. built-up from rubberised plies each having all cords arranged substantially parallel
- B60C 9/2003 ... { characterised by the materials of the belt cords}
- B60C 9/2006 { consisting of steel cord plies only}

- B60C 9/2009 { comprising plies of different materials}
- B60C 9/22 . . . the plies being arranged with all cords disposed along the circumference of the tyre
- B60C 9/2204 {obtained by circumferentially narrow strip winding}
- B60C 9/24 . . . built-up of arcuate parts
- B60C 9/26 . . . Folded plies
- B60C 9/263 . . . { further characterised by an endless zigzag configuration in at least one belt ply, i.e. no cut edge being present}
- B60C 9/28 . . . characterised by the belt or breaker dimensions or curvature relative to carcass ([B60C 9/30](#) takes precedence)
- B60C 9/30 . . . asymmetric to the midcircumferential plane of the tyre

B60C 11/00 Tyre tread bands; Tread patterns; Anti-skid inserts

- B60C 11/0008 . { characterised by the tread rubber }
- B60C 11/0041 . { comprising different tread rubber layers}
- B60C 11/005 . . { with cap and base layers}
- B60C 11/0058 . . . { with different cap rubber layers in the axial direction}
- B60C 11/0066 { having an asymmetric arrangement}
- B60C 11/0075 . . . { with different base rubber layers in the axial direction}
- B60C 11/0083 . { characterised by the curvature of the tyre tread}
- B60C 11/01 . Shape of the shoulders between tread and sidewall, e.g. rounded, stepped, cantilevered ([arrangements of grooves or ribs on the sidewalls](#) [B60C 13/02](#))
- B60C 11/02 . Replaceable treads
- B60C 11/03 . Tread patterns
- B60C 11/0302 . . { directional pattern, i.e. with main rolling direction}
- B60C 11/0304 . . { Asymmetric patterns}
- B60C 11/0306 . . { Patterns comprising block rows or discontinuous ribs}
- B60C 11/0309 . . . { further characterised by the groove cross-section}
- B60C 11/0311 . . { Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}
- B60C 11/0316 . . . { further characterised by the groove cross-section}
- B60C 11/0318 . . { irregular patterns with particular pitch sequence}
- B60C 11/032 . . { Patterns comprising isolated recesses}
- B60C 11/0323 . . . { tread comprising channels under the tread surface, e.g. for draining water}
- B60C 11/0327 . . { characterised by special properties of the tread pattern}
- B60C 11/033 . . . { by the void or net-to-gross ratios of the patterns}
- B60C 11/0332 . . . { by the footprint-ground contacting area of the tyre tread}
- B60C 11/04 . . with grooves or ribs
- B60C 11/042 . . . { further characterised by the groove cross-section}
- B60C 11/045 { the groove walls having a three-dimensional shape}

- B60C 11/047 { the groove bottom comprising stone trapping protection elements, e.g. ribs}
- B60C 11/11 . . with isolated elements, e.g. blocks
- B60C 11/12 . . with narrow slits or incisions
- B60C 11/1204 . . . { with special shape of the sipe}
- B60C 11/1218 { Three-dimensional shape with regard to depth and extending direction}
- B60C 11/1222 { Twisted or warped shape in the sipe plane }
- B60C 11/1236 . . . { with special arrangements in the tread pattern}
- B60C 11/124 { inclined with regard to a plane normal to the tread surface}
- B60C 11/125 { arranged at the groove bottom}
- B60C 11/1259 . . . { Depth of the sipe}
- B60C 11/1263 { different within the same sipe}
- B60C 11/1272 . . . { Width of the sipe}
- B60C 11/1281 { different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length }
- B60C 11/13 . . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
- B60C 11/1307 . . . { with special features of the groove walls}
- B60C 11/1315 { having variable inclination angles, e.g. warped groove walls}
- B60C 11/1323 { asymmetric}
- B60C 11/1346 { covered by a rubber different from the tread rubber}
- B60C 11/1353 . . . { with special features of the groove bottom}
- B60C 11/1369 . . . { Tie bars for linking block elements and bridging the groove}
- B60C 11/1376 . . . { Three dimensional block surfaces departing from the enveloping tread contour}
- B60C 11/1384 { with chamfered block corners}
- B60C 11/1392 { with chamfered block edges}
- B60C 11/14 . . Anti-skid inserts, e.g. vulcanised into the tread band
- B60C 11/16 . . of plug form, e.g. made from metal, textile
- B60C 11/1606 . . . {retractable plug}
- B60C 11/1612 [N: actuated by fluid, e.g. using fluid pressure difference
- B60C 11/1618 { actuated by temperature, e.g. by means of temperature sensitive elements}
- B60C 11/1625 . . . { Arrangements thereof in the tread patterns, e.g. irregular}
- B60C 11/1631 . . . { inclined with regard to the radial direction}
- B60C 11/1637 . . . { Attachment of the plugs into the tread; e.g. screwed}
- B60C 11/1643 . . . { with special shape of the plug-body portion, i.e. not cylindrical}
- B60C 11/165 { conical}
- B60C 11/1656 { concave or convex, e.g. barrel-shaped}
- B60C 11/1662 { helical-shaped}
- B60C 11/1668 { with an additional collar}
- B60C 11/1675 . . . { with special shape of the plug- tip}
- B60C 11/1681 { Spherical top portions}
- B60C 11/1687 { Multiple tips}

- B60C 11/1693 . . . { Attachment of the plug-tip within the plug-body}
- B60C 11/18 . . of strip form, e.g. metallic combs, rubber strips of different wear resistance ([B60C 11/20](#) takes precedence)
- B60C 11/185 . . . {of metal comb form}
- B60C 11/20 . . in coiled form

- B60C 11/22 . Tread rings between dual tyres

- B60C 11/24 . Wear-indicating arrangements
- B60C 11/243 . . { Tread wear sensors, e.g. electronic sensors}
- B60C 11/246 . . { Tread wear monitoring systems (tyre pressure monitoring [B60C 23/04](#))}

- B60C 13/00** **Tyre sidewalls; Protecting, decorating, marking, or the like, thereof ([B60C 17/08](#) takes precedence; tyre shoulders [B60C 11/01](#))**

- B60C 13/001 . {Decorating, marking or the like}
- B60C 13/002 . { Protection against exterior elements}
- B60C 13/003 . {Decorating, marking or the like}
- B60C 13/004 . . { of the internal side of the tyre}

- B60C 13/009 . { comprising additional bead cores in the sidewall}

- B60C 13/02 . Arrangement of grooves or ribs
- B60C 13/023 . . { preventing watersplash}

- B60C 13/04 . having annular inlays or covers, e.g. white sidewalls

- B60C 15/00** **Tyre beads, e.g. ply turn-up or overlap**

- WARNING**

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- Documents from the backlog of [B60C 9/023](#) are in the process of being systematically transferred to [B60C 15/00](#)

- B60C 15/0009 . { features of the carcass terminal portion}
- B60C 15/0018 . . { not folded around the bead core, e.g. floating or down ply}
- B60C 15/0027 . . { with low ply turn-up, i.e. folded around the bead core and terminating at the bead core}
- B60C 15/0036 . . { with high ply turn-up, i.e. folded around the bead core and terminating radially above the point of maximum section width}
- B60C 15/0045 . . . { with ply turn-up up to the belt edges, i.e. folded around the bead core and extending to the belt edges}
- B60C 15/0054 . . { with ply turn-up portion parallel and adjacent to carcass main portion}

- B60C 15/0063 .. { with ply turn-up portion diverging from carcass main portion}
- B60C 15/0072 .. { with ply reverse folding, i.e. carcass layer folded around the bead core from the outside to the inside}
- B60C 15/0081 .. { the carcass plies folded around or between more than one bead core}
- B60C 15/02 . Seating or securing beads on rims (sealing means between beads and rims of tubeless tyres [B60C 5/16](#); means for securing solid tyres on rims [B60C 7/24](#); rims [B60B 21/00](#))
- B60C 15/0203 .. {Axial seating, i.e. the lower part of the sidewall in contact with or adjacent to the exterior of the rim is approximately parallel to the axis of the wheel}
- B60C 15/0206 .. {Reversed seating, i.e. the bead is in contact with the inside of the rim and also the lower part of the sidewall turns through approximately 270 degrees}
- B60C 15/0209 .. {Supplementary means for the beads, each bead being secured independently of the other bead}
- B60C 15/0213 ... { the bead being clamped by rings, cables, rim flanges or other parts of the rim}
- B60C 15/0216 ... { the bead being pierced by bolts, rivets, clips or other elements}
- B60C 15/022 ... { the bead being secured by turned-in rim flanges, e.g. rim of the clincher type}
- B60C 15/0223 ... { the bead being secured by clip-hook elements not forming part of the rim flange}
- B60C 15/0226 ... { the bead being secured by protrusions of the rim extending from the bead seat, e.g. hump or serrations}
- B60C 15/023 ... { the bead being secured by bead extensions which extend over and wrap around the rim flange}
- B60C 15/0233 .. {Securing tyres without beads; Securing closed torus tyres}
- B60C 15/0236 .. {Beads seated or secured asymmetrically}
- B60C 15/024 .. Bead contour, e.g. lips, grooves or ribs
- B60C 15/0242 ... { with bead extensions located radially outside the rim flange position, e.g. rim flange protectors}
- B60C 15/0247 ... { with reverse bead seat inclination, i.e. the axially inner diameter of the bead seat is bigger than the axially outer diameter thereof}
- B60C 15/028 .. Spacers between beads (emergency load supporting means [B60C 17/00](#))
- B60C 15/032 ... inflatable
- B60C 15/036 .. Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation
- B60C 15/04 . Bead cores (producing bead-rings or bead-cores for tyres [B29D 30/48](#))
- B60C 15/05 .. Multiple, i.e. with two or more cores in each bead
- B60C 15/06 . Flipper strips, fillers, or chafing strips
- B60C 15/0603 .. { characterised by features of the bead filler or apex (compositions of the apex rubber [B60C 1/00P2](#))}
- B60C 15/0607 ... { comprising several parts, e.g. made of different rubbers}
- B60C 15/0628 .. { comprising a bead reinforcing layer}
- B60C 15/0632 ... { using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler}
- B60C 15/0635 ... { using chippers between the carcass layer and chafer rubber wrapped around the bead}
- B60C 15/0653 ... { with particular configuration of the cords in the respective bead reinforcing

layer}

B60C 17/00

Tyres characterised by means enabling restricted operation in damaged or deflated condition; Accessories therefor (having multiple separate inflatable chambers [B60C 5/20](#); self-sealing arrangements or agents [B60C 21/08](#))

- B60C 17/0009 . { comprising sidewall rubber inserts, e.g. crescent shaped inserts}
- B60C 17/0018 .. { two or more inserts in each sidewall portion}
- B60C 17/0027 .. { comprising portions of different rubbers in a single insert}
- B60C 17/0036 .. { comprising additional reinforcements}
- B60C 17/0045 .. { comprising grooves or ribs, e.g. at the inner side of the insert}

- B60C 17/009 . { comprising annular protrusions projecting into the tyre cavity}

- B60C 17/01 . utilising additional inflatable supports which become load supporting in emergency
- B60C 17/02 .. inflated or expanded in emergency only

- B60C 17/04 . utilising additional non-inflatable supports which become load-supporting in emergency
- B60C 17/041 .. { characterised by coupling or locking means between rim and support}
- B60C 17/042 ... { preventing sliding or rotation between support and rim}
- B60C 17/043 .. { made-up of an annular metallic shell}
- B60C 17/044 .. { Expandable supports}
- B60C 17/045 .. { Rotatable supports relative to the rim}
- B60C 17/046 ... { by means of ball bearings}
- B60C 17/047 .. { comprising circumferential ribs}
- B60C 17/048 .. { comprising transverse ribs}
- B60C 17/06 .. resilient
- B60C 17/061 ... { comprising lateral openings}
- B60C 17/065 ... { made-up of foam inserts (tyres filled with foam [B60C 5/002](#))}
- B60C 17/066 ... { made-up of plural spherical elements provided in the tyre chamber}

- B60C 17/08 . Means facilitating folding of sidewalls, e.g. run-flat sidewalls (for storage purposes [B60C 3/08](#))

- B60C 17/10 . Internal lubrication
- B60C 17/103 .. { by means of surface coating, e.g. PTFE}
- B60C 17/106 .. { Composition of the lubricant}

B60C 19/00

Tyre parts or constructions not otherwise provided for

- B60C 19/001 . {tyre partially filled with liquids}

- B60C 19/002 . { Noise damping elements provided in the tyre structure or attached thereto, e.g. in the tyre interior}

- B60C 19/003 . {ballast tyre}
- B60C 19/04 . Tyres with openings closeable by means other than the rim; Closing means therefor
- B60C 19/08 . Electric charge dissipating arrangements
- B60C 19/082 .. { comprising a conductive tread insert}
- B60C 19/084 .. { using conductive carcasses}
- B60C 19/086 .. { using conductive sidewalls}
- B60C 19/088 .. { using conductive beads}
- B60C 19/12 . Puncture preventing arrangements ([B60C 9/00](#) takes precedence; inflatable inserts having reinforcing means [B60C 5/08](#))
- B60C 19/122 .. { disposed inside of the inner liner}
- B60C 19/125 .. {disposed removable on the tyre}
- B60C 19/127 .. { for inner tubes}

- B60C 23/00** **Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles (measuring in general G01, e.g. [G01L 17/00](#); remote signalling in general G08); Arrangement of tyre inflating devices on vehicles, e.g. of pumps, of tanks {(supplying air for tyre inflation [B60S 5/04](#))}; Tyre cooling arrangements**
- B60C 23/001 . {Devices for manually or automatically controlling or distributing tyre pressure whilst the vehicle is moving}
- B60C 23/002 .. {by monitoring conditions other than tyre pressure or deformation}
- B60C 23/003 .. {the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre}
- B60C 23/004 .. {the control being done on the wheel, e.g. using a wheel-mounted reservoir}
- B60C 23/005 . { Devices specially adapted for special wheels arrangements}

- NOTE**
- [B60C 23/00B](#), [B60C 23/02](#), [B60C 23/04](#), [B60C 23/06](#) or [B60C 23/08](#)

- B60C 23/006 .. { having two wheels only}
- B60C 23/007 .. { having multiple wheels arranged side by side}
- B60C 23/008 .. { having wheels on more than two axles}
- B60C 23/009 .. { having wheels on a trailer}

- B60C 23/02 . Signalling devices actuated by tyre pressure {(hand-held tyre pressure gauges [G01L 17/00](#))}
- B60C 23/04 .. mounted on the wheel or tyre
- B60C 23/0401 ... { characterised by the type of alarm}
- B60C 23/0403 [Mechanically generated audible signals, e.g. by buzzer or whistle signals]
- B60C 23/0405 [Mechanically generated visible signals, e.g. by using a gauge needle]
- B60C 23/0406 { Alarms noticeable from outside the vehicle, e.g. indication in side mirror,

front light or audible alarms ([B60C 23/0403](#), [B60C 23/0405](#) take precedence)}

B60C 23/0408	...	{ transmitting the signals by non-mechanical means from the wheel or tyre to a vehicle body mounted receiver}
B60C 23/041	....	{ Means for supplying power to the signal- transmitting means on the wheel}
B60C 23/0411	.....	{ Piezo-electric generators}
B60C 23/0413	.....	{ Wireless charging of active radio frequency circuits}
B60C 23/0415	....	{ Automatically identifying wheel mounted units, e.g. after replacement or exchange of wheels}
B60C 23/0416	.....	{ allocating a corresponding wheel position on vehicle, e.g. front/left or rear/right}
B60C 23/0418	....	{ Sharing hardware components like housing, antenna, receiver or signal transmission line with other vehicle systems like keyless entry or brake control units}
B60C 23/042	.....	{ cooperating with wheel hub mounted speed sensors}
B60C 23/0422	....	{ characterised by the type of signal transmission means}
B60C 23/0423	.....	{Photo-electric, infra-red or visible light means}
B60C 23/0425	.....	{ Means comprising permanent magnets, e.g. Hall-effect or Reed-switches }
B60C 23/0427	.....	{ Near field transmission with inductive or capacitive coupling means}
B60C 23/0428	.....	{ using passive wheel mounted resonance circuits}
B60C 23/043	.....	{ using transformer type signal transducers, e.g. rotary transformers}
B60C 23/0432	.....	{ using vehicle structural parts as signal path, e.g. chassis, axle or fender}
B60C 23/0433	.....	{Radio signals}
B60C 23/0435	.....	{ Vehicle body mounted circuits, e.g. transceiver or antenna fixed to central console, door, roof, mirror or fender}
B60C 23/0437	.....	{ Means for detecting electromagnetic field changes not being part of the signal transmission per se, e.g. strength, direction, propagation or masking}
B60C 23/0438	.....	{ comprising signal transmission means; e.g. for a bidirectional communication with a corresponding wheel mounted receiver}
B60C 23/044	.....	{ Near field triggers, e.g. magnets or triggers with 125 KHz}
B60C 23/0442	.....	{ the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data}
B60C 23/0444	.....	{ Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders}
B60C 23/0445	.....	{ Means for changing operating mode, e.g. sleep mode, factory mode or energy saving mode}
B60C 23/0447	.....	{ Wheel or tyre mounted circuits}

NOTE

B60C 23/04C6D12 and subgroups only

B60C 23/0449	{ Passive transducers, e.g. using surface acoustic waves, backscatter technology or pressure sensitive resonators (near field passive transducers B60C 23/0428)}
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B60C 23/045	{ Means for detecting electromagnetic field changes being not part of the signal transmission per se; e.g. strength, direction, propagation or masking}
B60C 23/0452	.....	{ Antenna structure, control or arrangement (vehicle tyre mounted antennas H01Q 1/2241)}
B60C 23/0454	.....	{ Means for changing operation mode, e.g. sleep mode, factory mode or energy save mode}
B60C 23/0455	.....	{ Transmission control of wireless signals}
B60C 23/0457	.....	{ self triggered by timer}
B60C 23/0459	.....	{ self triggered by motion sensor}
B60C 23/0461	.....	{ externally triggered; e.g. by wireless request signal, magnet or manual switch}
B60C 23/0462	.....	{ Structure of transmission protocol}
B60C 23/0464	.....	{ to avoid signal interference}
B60C 23/0466	.....	{ with signals sent by transmitters mounted on adjacent vehicles}
B60C 23/0467	.....	{Electric contact means, e.g. slip-rings, rollers, brushes}
B60C 23/0469	.....	{ Transmission by sound, e.g. ultra-sound}
B60C 23/0471	.....	{ System initialisation, e.g. upload or calibration of operating parameters}
B60C 23/0472	.....	[to manually allocate ID codes or mounting positions, e.g. by service technicians]
B60C 23/0474	.....	{ Measurement control, e.g. setting measurement rate or calibrating of sensors; Further processing of measured values, e.g. filtering, compensating or slope monitoring}
B60C 23/0476	.....	{ Temperature compensation of measured pressure values}
B60C 23/0477	.....	{ Evaluating waveform of pressure readings}
B60C 23/0479	.....	{ Communicating with external units being not part of the vehicle, e.g. tools for diagnostic, mobile phones, electronic keys or service stations}
B60C 23/0481	.....	{ System diagnostic, e.g. monitoring battery voltage, detecting hardware detachments or identifying wireless transmission failures}
B60C 23/0483	.....	{ Wireless routers between wheel mounted transmitters and chassis mounted receivers}
B60C 23/0484	.....	{ Detecting an ongoing tyre inflation}
B60C 23/0486	.....	{ comprising additional sensors in the wheel or tyre mounted monitoring device, e.g. movement sensors, microphones or earth magnetic field sensors}
B60C 23/0488	.....	{ Movement sensor, e.g. for sensing angular speed, acceleration or centripetal force}
B60C 23/0489	.....	{ for detecting the actual angular position of the monitoring device while the wheel is turning}
B60C 23/0491	.....	{ Constructional details of means for attaching the control device}
B60C 23/0493	.....	{ for attachment on the tyre}
B60C 23/0494	.....	{ Valve stem attachments positioned inside the tyre chamber}
B60C 23/0496	.....	{ Valve stem attachments positioned outside of the tyre chamber}
B60C 23/0498	.....	{ for rim attachments (B60C 23/0494 , B60C 23/0496 takes precedence)}
B60C 23/06	.....	• Signalling devices actuated by deformation of the tyre, { e.g. tyre mounted deformation sensors or indirect determination of tyre deformation based on wheel speed,

- wheel-centre to ground distance or inclination of wheel axle}
- B60C 23/061 . . {by monitoring wheel speed (measuring distance traversed on the ground by vehicles [G01C 22/00](#))}
- B60C 23/062 . . . { Frequency spectrum analysis of wheel speed signals, e.g. using Fourier transformation}
- B60C 23/063 . . { Generating directly an audible signal by deformation of the tyre (by touching the ground [B60C 23/085](#))}
- B60C 23/064 . . [comprising tyre mounted deformation sensors, e.g. to determine road contact area]
- B60C 23/065 . . { by monitoring vibrations in tyres or suspensions ([B60C 23/062](#) takes precedence)}
- B60C 23/066 . . { by monitoring wheel-centre to ground distance}
- B60C 23/067 . . { by monitoring chassis to ground distance}
- B60C 23/068 . . { by monitoring chassis to tyre distance}
- B60C 23/08 . . by touching the ground
- B60C 23/085 . . . {putting directly into action an audible signal}

- B60C 23/10 . Arrangements of tyre-inflating pumps mounted on vehicles {(23/00B takes precedence)}
- B60C 23/105 . . { the pump being mounted in the saddle-pillar of a bicycle}
- B60C 23/12 . . operated by a running wheel
- B60C 23/14 . . operated by the prime mover of the vehicle

- B60C 23/16 . Arrangements of air tanks mounted on vehicles {([B60C 23/001](#) takes precedence)}

- B60C 23/18 . Tyre cooling arrangements {e.g. heat shields (wheels with cooling fins [B60B 19/10](#))}
- B60C 23/19 . . for dissipating heat

- B60C 23/20 . Devices for measuring or signalling tyre temperature { only}

- B60C 25/00** **Apparatus or tools adapted for mounting, removing {,repairing} or inspecting {pneumatic or solid} tyres** ({apparatus or tools for mounting or dismounting wheels [B60B 29/00](#)}; apparatus or tools characterised by the means for holding wheels or parts thereof [B60B 30/00](#))

- B60C 25/002 . { Inspecting tyres}

- NOTE**
- When classifying in this group, classification is also made in the appropriate subgroups of [B60C 25/0548](#)

- B60C 25/005 . . { inside surface}
- B60C 25/007 . . { outside surface (measuring profile depth [G01B 11/22](#))}

- B60C 25/01 . for removing tyres from, or mounting tyres on, wheels
- B60C 25/015 . . { for only breaking the beads}
- B60C 25/02 . . Tyre levers or the like, e.g. hand-held (machine operated [B60C 25/05](#))

B60C 25/025	...	{with a jack}
B60C 25/04	...	pivotal about the wheel axis, or movable along the rim edge, e.g. rollable
B60C 25/05	..	Machines, {i.e. motorized apparatus}
B60C 25/0503	...	{ for mounting only}
B60C 25/0506	...	{ for demounting only}
B60C 25/0509	...	{ for inserting additional parts; e.g. support rings, sensors}
B60C 25/0512	...	{ Integrated systems performing multiple operations e.g. assembly lines}
B60C 25/0515	...	{ Automated devices, e.g. mounting robots}
B60C 25/0518	...	{ Horizontal wheel axis in working position}
B60C 25/0521	...	{ Handling of rim or tyre, e.g. lifting and positioning devices}
B60C 25/0524	...	{ Separating tyres from rims, e.g. by destroying}
B60C 25/0527	...	{ Adapting to different wheel diameters, i.e. distance between support and tool}
B60C 25/053	...	{ Support of wheel parts during machine operation}
B60C 25/0533	....	{ Fixing the tyre only, e.g. gripping the tread portion for inserting the rim}
B60C 25/0536	....	{ axially fixing the rim, e.g. pulling devices}
B60C 25/0539	....	{ radially fixing the rim, e.g. with gripping claws}
B60C 25/0542	....	{ with self-centering means, e.g. cones}
B60C 25/0545	....	{ with rotary motion of tool or tyre support, e.g. turntables}
B60C 25/0548	...	{ equipped with sensing means, e.g. for positioning, measuring or controlling}
B60C 25/0551	....	{ mechanical}
B60C 25/0554	....	{ optical, e.g. cameras}
B60C 25/0557	....	{ thermal}
B60C 25/056	....	{ measuring speed, acceleration or forces}
B60C 25/0563	...	{ Tools interacting with the tyre and moved in relation to the tyre during operation}
B60C 25/0566	....	{ rolling only}
B60C 25/0569	....	{ gliding only}
B60C 25/0572	....	{ pressing only}
B60C 25/0575	....	{ levering only}
B60C 25/0578	....	{ hooking only}
B60C 25/0581	....	{ Translational tool trajectory only}
B60C 25/0584	....	{ Predetermined tool path, e.g. coulisse, multi-link}
B60C 25/0587	....	{ Programmed tool path, e.g. robot arm with multiple degrees of freedom}
B60C 25/059	....	{ Conjoint tool operations, i.e. at least two tools cooperating simultaneously}
B60C 25/0593	....	{ Multi-functional tools for performing at least two operations e.g. bead breaking and bead seeking}
B60C 25/0596	...	{ Soaping devices}
B60C 25/12	...	for only seating the beads {WARNING: Not complete, see B60C 25/05 , B60C 25/146 }

WARNING

Not complete pending reclassification; see also groups [B60C 25/05](#), [B60C 25/14D](#)

B60C 25/122 acting on the tyre tread {WARNING: Not complete, see [B60C 25/05](#), [B60C 25/146](#)}

WARNING

Not complete pending reclassification; see also groups [B60C 25/05](#), [B60C 25/14D](#)

B60C 25/125 . . . for only breaking the beads

B60C 25/128 acting axially on the whole circumference of the bead or side wall

B60C 25/13 acting axially at localised regions of the bead or side wall

B60C 25/132 . . . for removing and mounting tyres (for only breaking the beads [B60C 25/125](#); {for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims [B60C 25/146](#)})

B60C 25/135 having a tyre support or a tool, movable along wheel axis

B60C 25/138 with rotary motion of tool or tyre support

B60C 25/14 . . Apparatus or tools for spreading {or locating} tyre beads

B60C 25/142 . . {Devices for tightening or expanding the felly, devices for spreading the tyres}

B60C 25/145 . . { for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims; e.g. air filling bell}

B60C 25/147 . . { Safety cages for inflation}

B60C 25/15 . . with means for inverting the tyre

WARNING

From 24 June, 1987, [B60C 25/16](#) is no longer used for the classification of new documents

Documents from the backlog of these groups are in the process of being systematically transferred to [B29C 73/08](#), [B60C 73/12](#), [B60C 73/24](#)

B60C 25/16 . . Tools for repairing damaged tyres

B60C 25/18 . . Tools for mounting or demounting air valves

B60C 25/185 . . { Automated devices, e.g. robots}

B60C 25/20 . . Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims

B60C 27/00 **Non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels** {(vehicle mounted non-skid chains [B60B 39/003](#))}

B60C 27/003 . . { Mounting aids, e.g. auxiliary tensioning tools, slotted ramps}

B60C 27/006 . . { provided with protective parts, e.g. rubber elements to protect the rim portion}

B60C 27/02 . . extending over restricted arcuate part of tread ([B60C 27/20](#) takes precedence)

B60C 27/0207 . . { involving lugs or rings taking up wear, e.g. chain links, chain connectors (chain couplings for e.g. hoisting [F16G 15/00](#))}

B60C 27/0215 . . . { Profiled links, e.g. cross-section other than round}

- B60C 27/0223 . . . [N: Studded links, i.e. traction enhancing parts located on the link or inserted into the link
- B60C 27/023 .. { provided with radial arms for supporting the ground engaging parts on the wheel}
- B60C 27/0238 .. { provided with tensioning means}
- B60C 27/0246 . . . { Resilient pretension}
- B60C 27/0253 . . . { Centrifugal forces for tensioning while driving}
- B60C 27/0261 .. { provided with fastening means}
- B60C 27/0269 . . . { acting on the wheel, e.g. on the rim or wheel bolts}
- B60C 27/0276 { through apertures in the rim, e.g. fastening from one lateral side to the other lateral side of the rim; extending axially through the rim}
- B60C 27/0284 . . . { acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}
- B60C 27/0292 . . . { acting on the sidewall of the tyre}
- B60C 27/04 .. the ground-engaging part being rigid
- B60C 27/045 . . . {involving retractable devices (fixing of spade lugs [B60B 15/00](#))}
- B60C 27/06 . . extending over the complete circumference of tread, e.g. made of chains {cables ([B60C 27/20](#) takes precedence)}
- B60C 27/061 .. { provided with radial arms for supporting the ground engaging parts on the tread}
- B60C 27/062 .. { provided with fastening means}
- B60C 27/063 . . . { acting on the wheel, e.g. on the rim or wheel bolts}
- B60C 27/064 . . . { through apertures in the rim, e.g. fastening from one lateral side to the other lateral side of the rim; extending axially through the rim}
- B60C 27/065 . . . { acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}
- B60C 27/066 . . . { acting on the sidewall of the tyre}
- B60C 27/067 .. { Special chain layout; i.e. distribution of chain portions over the tread e.g. arranged in polygon pattern}
- B60C 27/068 .. { the ground-engaging part being rigid}
- B60C 27/08 .. involving lugs or rings taking up wear {chain links, chain connectors}
- B60C 27/083 . . . { Profiled links, i.e. cross-section other than round, e.g. hexagonal}
- B60C 27/086 . . . { Studded links, i.e. traction enhancing parts located on the link or inserted into the link}
- B60C 27/10 .. having tensioning means
- B60C 27/12 . . . resilient
- B60C 27/125 { Centrifugal forces for tensioning while driving}
- B60C 27/14 .. automatically attachable
- B60C 27/145 . . . {the anti-skid device being wound around the wheel by rotation from a point connected to the frame of the vehicle}
- B60C 27/16 .. formed of close material, e.g. leather {synthetic mats}
- B60C 27/18 . . . the material being fabric, e.g. woven wire
- B60C 27/20 . . having ground-engaging plate-like elements
- B60C 27/22 . . for tandem tyres (endless-track features [B62D](#))

- B60C 29/00** Arrangements of tyre-inflating valves to tyres or rims; {Connection of valves to tyres or rims;} Accessories for tyre-inflating valves, not otherwise provided for (tools for mounting or demounting valves [B60C 25/18](#); valves [per se](#) , valve dust caps [F16K](#))
- [B60C 29/002](#) . { characterised by particular features of the valve core}
- [B60C 29/005](#) . {Arrangements of tyre inflating valves, specially adapted for tyres with segmental sections or for multichamber tyres}
- [B60C 29/007](#) . { for tyres with segmental sections or for multi-chamber tyres}
- [B60C 29/02](#) . Connection to rims {([B60C 29/005](#) takes precedence)}
- [B60C 29/04](#) . Connection to tyres {([B60C 29/005](#) takes precedence)}
- [B60C 29/06](#) . Accessories for tyre-inflating valves, e.g. housings, guards, covers for valve caps, locks, not otherwise provided for {, safety devices for overpressure (wrenches for screwing and unscrewing tire valve cups [B25B 27/0057](#))}
- [B60C 29/062](#) .. { for filling a tyre with particular materials, e.g. liquids ([B60C 5/004](#), [B60C 5/005](#) take precedence)}
- [B60C 29/064](#) .. { Hose connections for pneumatic tyres, e.g. to spare wheels}
- [B60C 29/066](#) .. {Hose connections for pneumatic tyres, e.g. to spare wheels}
- [B60C 29/068](#) .. { Pressure relief devices, i.e. safety devices for overpressure}
- B60C 99/00** Subject matter not provided for in other groups of this subclass
- [B60C 99/003](#) . { Tyre heating arrangements}
- [B60C 99/006](#) . { Computer aided tyre design or simulation}
- B60C 2001/00** Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition
- NOTE**
- Tyres characterised by compositions only, i.e. having no significant tyre structure, are classified only with the compositions, e.g. [C08K](#), [C08L](#)
- [B60C 2001/0033](#) . Compositions of the sidewall inserts, e.g. for runflat
- [B60C 2001/005](#) . Compositions of the bead portions, e.g. clinch or chafer rubber or cushion rubber
- [B60C 2001/0058](#) .. Compositions of the bead apices
- [B60C 2001/0066](#) . Compositions of the belt layers
- [B60C 2001/0075](#) . Compositions of belt cushioning layers

- B60C 2001/0083 . Compositions of the cap ply layers
- B60C 2001/0091 . Compositions of non-inflatable or solid tyres
- B60C 2003/00** **Tyres characterised by the transverse section** (characterised by rail-engaging elements [B60B 17/00](#))
- B60C 2003/005 . Twin tyres
- B60C 2005/00** **Inflatable pneumatic tyres or inner tubes** ([B60C 1/00](#), [B60C 9/00](#) to [B60C 17/00](#) take precedence)
- B60C 2005/12 . without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim ([B60C 5/20](#) takes precedence)
- B60C 2005/14 . . with impervious liner or coating on the inner wall of the tyre (**B60C 21/04**, **B60C 21/08** take precedence)
- B60C 2005/145 . . . made of laminated layers
- B60C 2005/147 . . . characterised by the joint or splice
- B60C 2007/00** **Non-inflatable or solid tyres** ([B60C 1/00](#) takes precedence; tyres or rims characterised by rail engaging elements [B60B 17/00](#))
- B60C 2007/005 . made by casting, e.g. of polyurethane
- B60C 2007/10 . characterised by means for increasing resiliency (highly resilient wheels [B60B 9/00](#))
- B60C 2007/107 . . comprising lateral openings
- B60C 2007/14 . . using springs
- B60C 2007/146 . . . extending substantially radially, e.g. like spokes
- B60C 2009/00** **Reinforcements or ply arrangement of pneumatic tyres** (inserts having reinforcing means [B60C 5/08](#); bead structure, e.g. turnup or overlap construction, [B60C 15/00](#); tyre cords per se [D02G 3/48](#); fabrics per se [D03D](#), [D04H](#); metal ropes or cables per se [D07B 1/06](#)){ B}
- NOTE**
- When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned
- B60C 2009/0007 . { Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal}
- B60C 2009/0014 . . Surface treatments of steel cords
- B60C 2009/0021 . . Coating rubbers for steel cords
- B60C 2009/0035 . Reinforcements made of organic materials, e.g. rayon, cotton or silk
- B60C 2009/0071 . characterised by special physical properties of the reinforcements

- B60C 2009/0078 .. Modulus
- B60C 2009/0085 .. Tensile strength
- B60C 2009/0092 .. Twist structure

- B60C 2009/02 . Carcasses
- B60C 2009/0215 .. Partial carcass reinforcing plies, i.e. the plies neither crossing the equatorial plane nor folded around the bead core
- B60C 2009/0223 .. comprising a cushion layer between adjacent carcass plies
- B60C 2009/0238 .. { characterised by special physical properties of the carcass ply}
- B60C 2009/0246 ... Modulus of the ply
- B60C 2009/0253 being different between adjacent plies
- B60C 2009/0261 being different within the same ply
- B60C 2009/0269 .. Physical properties or dimensions of the carcass coating rubber
- B60C 2009/0276 ... Modulus; Hardness; Loss modulus or "tangens delta"
- B60C 2009/0284 ... Thickness
- B60C 2009/04 .. the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
- B60C 2009/0408 ... Carcass joints or splices
- B60C 2009/0416 ... Physical properties or dimensions of the carcass cords
- B60C 2009/0425 Diameters of the cords; Linear density thereof
- B60C 2009/0433 Modulus
- B60C 2009/0441 Density in width direction
- B60C 2009/045 Tensile strength
- B60C 2009/0458 Elongation of the reinforcements at break point
- B60C 2009/0466 Twist structures
- B60C 2009/0475 ... Particular materials of the carcass cords
- B60C 2009/0483 ... Different cords in the same layer
- B60C 2009/0491 ... with special path of the carcass cords, e.g. sinusoidal
- B60C 2009/14 .. built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
- B60C 2009/145 ... at the inner side of the carcass structure

- B60C 2009/18 . Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers
- B60C 2009/1807 .. { comprising fabric reinforcements}
- B60C 2009/1814 ... square woven
- B60C 2009/1828 .. characterised by special physical properties of the belt ply
- B60C 2009/1835 .. { Rubber strips or cushions at the belt edges (compositions B60C 1/00N2)}
- B60C 2009/1842 ... Width or thickness of the strips or cushions
- B60C 2009/1857 ... radially above the belt plies
- B60C 2009/1864 ... wrapped around the edges of the belt
- B60C 2009/1871 .. with flat cushions or shear layers between belt layers
- B60C 2009/1878 .. with flat cushions or shear layers between the carcass and the belt
- B60C 2009/1885 .. with belt ply between adjacent carcass plies

B60C 2009/1892	..	with belt ply radial inside the carcass structure
B60C 2009/20	..	built-up from rubberised plies each having all cords arranged substantially parallel
B60C 2009/2012	...	with particular configuration of the belt cords in the respective belt layers
B60C 2009/2016	....	comprising cords at an angle of 10 to 30 degrees to the circumferential direction
B60C 2009/2019	....	comprising cords at an angle of 30 to 60 degrees to the circumferential direction
B60C 2009/2022	....	comprising cords at an angle of 60 to 90 degrees to the circumferential direction
B60C 2009/2025	....	with angle different or variable in the same layer
B60C 2009/2029	....	with different cords in the same layer, i.e. cords with different materials or dimensions
B60C 2009/2032	....	characterised by the course of the belt cords, e.g. undulated or sinusoidal
B60C 2009/2035	...	built-up by narrow strips
B60C 2009/2038	...	using lateral belt strips at belt edges, e.g. edge bands
B60C 2009/2041	...	with an interrupted belt ply, e.g. using two or more portions of the same ply
B60C 2009/2045	...	with belt joints or splices
B60C 2009/2048	...	characterised by special physical properties of the belt plies
B60C 2009/2051	....	Modulus of the ply
B60C 2009/2054	.....	being different within the same ply
B60C 2009/2058	.....	being different between adjacent plies
B60C 2009/2061	...	Physical properties or dimensions of the belt coating rubber
B60C 2009/2064	....	Modulus; Hardness; Loss modulus or "tangens delta"
B60C 2009/2067	....	Thickness
B60C 2009/207	....	Double layers, e.g. using different rubbers in the same belt ply
B60C 2009/2074	...	Physical properties or dimension of the belt cord
B60C 2009/2077	....	Diameters of the cords; Linear density thereof
B60C 2009/208	....	Modulus of the cords
B60C 2009/2083	....	Density in width direction
B60C 2009/2087	.....	with variable density in the same layer
B60C 2009/209	....	Tensile strength
B60C 2009/2093	....	Elongation of the reinforcements at break point
B60C 2009/2096	....	Twist structures
B60C 2009/22	...	the plies being arranged with all cords disposed along the circumference of the tyre
B60C 2009/2204	....	{obtained by circumferentially narrow strip winding}
B60C 2009/2209	.....	characterised by tension of the cord during winding
B60C 2009/2214	....	characterised by the materials of the zero degree ply cords
B60C 2009/2219	....	with a partial zero degree ply at the belt edges - edge band
B60C 2009/2223	....	with an interrupted zero degree ply, e.g. using two or more portions for the same ply
B60C 2009/2228	....	characterised by special physical properties of the zero degree plies
B60C 2009/2233	.....	Modulus of the zero degree ply
B60C 2009/2238	....	Physical properties or dimensions of the ply coating rubber

B60C 2009/2242	.....	Modulus; Hardness; Loss modulus or "tangens delta"
B60C 2009/2247	.....	Thickness
B60C 2009/2252	....	Physical properties or dimension of the zero degree ply cords
B60C 2009/2257	.....	Diameters of the cords; Linear density thereof
B60C 2009/2261	.....	Modulus of the cords
B60C 2009/2266	.....	Density of the cords in width direction
B60C 2009/2271	.....	with variable density
B60C 2009/2276	.....	Tensile strength
B60C 2009/228	.....	Elongation of the reinforcements at break point
B60C 2009/2285	.....	Twist structures
B60C 2009/229	.....	characterised by the course of the cords, e.g. undulated or sinusoidal
B60C 2009/2295	.....	with different cords in the same layer
B60C 2009/26	..	Folded plies
B60C 2009/263	...	{ further characterised by an endless zigzag configuration in at least one belt ply, i.e. no cut edge being present}
B60C 2009/266	....	combined with non folded cut-belt plies
B60C 2009/28	..	characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence)
B60C 2009/283	...	characterised by belt curvature
B60C 2009/286	....	being substantially flat

B60C 2011/00 Tyre tread bands; Tread patterns; Anti-skid inserts

B60C 2011/0008	.	{ characterised by the tread rubber }
B60C 2011/0016	..	Physical properties or dimensions
B60C 2011/0025	...	Modulus
B60C 2011/0033	...	Thickness of the tread
B60C 2011/0091	.	built-up by narrow strip winding
B60C 2011/01	.	Shape of the shoulders between tread and sidewall, e.g. rounded, stepped, cantilevered (arrangements of grooves or ribs on the sidewalls B60C 13/02)
B60C 2011/013	..	provided with a recessed portion
B60C 2011/016	..	different rubber for tread wings
B60C 2011/03	.	Tread patterns
B60C 2011/0311	..	{ Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}
B60C 2011/0313	...	directional type
B60C 2011/0325	..	Irregular patterns with particular pitch sequence
B60C 2011/0327	..	{ characterised by special properties of the tread pattern}
B60C 2011/0334	...	Stiffness
B60C 2011/0337	..	characterised by particular design features of the pattern
B60C 2011/0339	...	Grooves
B60C 2011/0341	....	Circumferential grooves

B60C 2011/0344	.....	provided at the equatorial plane
B60C 2011/0346	.....	with zigzag shape
B60C 2011/0348	.....	Narrow grooves, i.e. having a width of less than 4 mm
B60C 2011/0351	.....	Shallow grooves, i.e. having a depth of less than 50% of other grooves
B60C 2011/0353	.....	characterised by width
B60C 2011/0355	.....	characterised by depth
B60C 2011/0358	....	Lateral grooves, i.e. having an angle of 45 to 90 degrees to the equatorial plane
B60C 2011/036	.....	Narrow grooves, i.e. having a width of less than 3 mm
B60C 2011/0362	.....	Shallow grooves, i.e. having a depth of less than 50% of other grooves
B60C 2011/0365	.....	characterised by width
B60C 2011/0367	.....	characterised by depth
B60C 2011/0369	.....	with varying depth of the groove
B60C 2011/0372	.....	with particular inclination angles
B60C 2011/0374	....	Slant grooves, i.e. having an angle of about 5 to 35 degrees to the equatorial plane
B60C 2011/0376	.....	characterised by width
B60C 2011/0379	.....	characterised by depth
B60C 2011/0381	....	Blind or isolated grooves
B60C 2011/0383	.....	at the centre of the tread
B60C 2011/0386	...	Continuous ribs
B60C 2011/0388	....	provided at the equatorial plane
B60C 2011/039	....	provided at the shoulder portion
B60C 2011/0393	....	Narrow ribs, i.e. having a rib width of less than 8 mm
B60C 2011/0395	.....	for linking shoulder blocks
B60C 2011/0397	....	Sacrificial ribs, i.e. ribs recessed from outer tread contour
B60C 2011/12	..	characterised by the use of narrow slits or incisions, e.g. sipes
B60C 2011/1204	...	{ with special shape of the sipe}
B60C 2011/1209	....	straight at the tread surface
B60C 2011/1213	....	sinusoidal or zigzag at the tread surface
B60C 2011/1227	....	having different shape within the pattern
B60C 2011/1231	....	being shallow, i.e. sipe depth of less than 3 mm
B60C 2011/1236	...	{ with special arrangements in the tread pattern}
B60C 2011/1245	....	being arranged in crossing relation, e.g. sipe mesh
B60C 2011/1254	....	with closed sipe, i.e. not extending to a groove
B60C 2011/1259	...	{ Depth of the sipe}
B60C 2011/1268	....	being different from sipe to sipe
B60C 2011/1272	...	{ Width of the sipe}
B60C 2011/1277	....	being narrow, i.e. less than 0.3 mm
B60C 2011/1286	....	being different from sipe to sipe
B60C 2011/129	...	Sipe density, i.e. the distance between the sipes within the pattern
B60C 2011/1295	....	variable

- B60C 2011/13 . . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
- B60C 2011/1307 . . . { with special features of the groove walls}
- B60C 2011/133 comprising recesses
- B60C 2011/1338 comprising protrusions
- B60C 2011/1353 . . . { with special features of the groove bottom}
- B60C 2011/1361 with protrusions extending from the groove bottom

- B60C 2011/14 . . Anti-skid inserts, e.g. vulcanised into the tread band
- B60C 2011/142 . . Granular particles, e.g. hard granules
- B60C 2011/145 . . Discontinuous fibres
- B60C 2011/147 . . Foamed rubber or sponge rubber on the tread band

- B60C 2013/00** **Tyre sidewalls; Protecting, decorating, marking, or the like, thereof** ([B60C 17/08](#) takes precedence; tyre shoulders [B60C 11/01](#))

- B60C 2013/005 . . Physical properties of the sidewall rubber
- B60C 2013/006 . . Modulus; Hardness; Loss modulus or "tangens delta"
- B60C 2013/007 . . Thickness

- B60C 2013/008 . . built-up by narrow strip winding

- B60C 2013/02 . . Arrangement of grooves or ribs
- B60C 2013/026 . . provided at the interior side only

- B60C 2013/04 . . having annular inlays or covers, e.g. while sidewalls
- B60C 2013/045 . . comprising different sidewall rubber layers

- B60C 2015/00** **Tyre beads, e.g. ply turn-up or overlap**

- B60C 2015/0009 . . { features of the carcass terminal portion}
- B60C 2015/009 . . Height of the carcass terminal portion defined in terms of a numerical value or ratio in proportion to section height

- B60C 2015/02 . . Seating or securing beads on rims ([sealing means between beads and rims of tubeless tyres B60C 5/16](#); means for securing solid tyres on rims [B60C 7/24](#); rims [B60B 21/00](#))
- B60C 2015/024 . . . Bead contour, e.g. lips, grooves or ribs
- B60C 2015/0245 Bead lips at the bead toe portion, i.e. the axially and radially inner end of the bead

- B60C 2015/04 . . Bead cores ([producing bead-rings or bead-cores for tyres B29D 30/48](#))
- B60C 2015/042 . . characterised by the material of the core, e.g. alloy
- B60C 2015/044 . . characterised by a wrapping layer
- B60C 2015/046 . . Cable cores, i.e. cores made-up of twisted wires
- B60C 2015/048 . . Polygonal cores characterised by the winding sequence

- B60C 2015/06 . Flipper strips, fillers, or chafing strips { and reinforcing layers for the construction of the bead}
- B60C 2015/0603 .. { characterised by features of the bead filler or apex (compositions of the apex rubber B60C 1/00P2)}
- B60C 2015/061 ... Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height
- B60C 2015/0614 .. characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim
- B60C 2015/0617 .. comprising a cushion rubber other than the chafer or clinch rubber
- B60C 2015/0621 ... adjacent to the carcass turnup portion
- B60C 2015/0625 ... provided at the terminal edge portion of a carcass or reinforcing layer
- B60C 2015/0628 .. { comprising a bead reinforcing layer}
- B60C 2015/0639 ... between carcass main portion and bead filler not wrapped around the bead core
- B60C 2015/0642 ... between carcass turn-up and bead filler not wrapped around the bead core
- B60C 2015/0646 ... at the axially inner side of the carcass main portion not wrapped around the bead core
- B60C 2015/065 ... at the axially outer side of the carcass turn-up portion not wrapped around the bead core
- B60C 2015/0653 ... { with particular configuration of the cords in the respective bead reinforcing layer}
- B60C 2015/0657 comprising cords at an angle of maximal 10 degrees to the circumferential direction
- B60C 2015/066 comprising cords at an angle of 10 to 30 degrees to the circumferential direction
- B60C 2015/0664 comprising cords at an angle of 30 to 60 degrees to the circumferential direction
- B60C 2015/0667 comprising cords at an angle of 60 to 90 degrees to the circumferential direction
- B60C 2015/0671 the cord angle being different or variable within the same layer
- B60C 2015/0675 characterised by the course of the cords, e.g. undulated or sinusoidal
- B60C 2015/0678 ... Physical properties of the bead reinforcing layer, e.g. modulus of the ply
- B60C 2015/0682 ... Physical properties or dimensions of the coating rubber
- B60C 2015/0685 ... Physical properties or dimensions of the cords, e.g. modulus of the cords
- B60C 2015/0689 Cord density in width direction
- B60C 2015/0692 ... characterised by particular materials of the cords
- B60C 2015/0696 .. Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex

- B60C 2017/00 Tyres characterised by means enabling restricted operation in damaged or deflated condition; Accessories therefor (having multiple separate inflatable chambers B60C 5/20; {(additional shear belt layers B60C 9/18K)})**
- B60C 2017/0009 . { comprising sidewall rubber inserts, e.g. crescent shaped inserts}
- B60C 2017/0054 .. Physical properties or dimensions of the inserts
- B60C 2017/0063 ... Modulus; Hardness; Loss modulus or "tangens delta"
- B60C 2017/0072 ... Thickness

- B60C 2017/0081 . comprising special reinforcing means in the crown area
- B60C 2017/04 . utilising additional non-inflatable supports which become load-supporting in emergency
- B60C 2017/06 . . resilient
- B60C 2017/063 . . . comprising circumferentially extending reinforcements
- B60C 2017/068 . . . comprising springs, e.g. helical springs

B60C 2019/00 Tyre parts or constructions not otherwise provided for

- B60C 2019/004 . Tyre sensors other than for detecting tyre pressure
- B60C 2019/005 . Magnets integrated within the tyre structure
- B60C 2019/006 . Warning devices, e.g. devices generating noise due to flat or worn tyres
- B60C 2019/007 . . triggered by sensors
- B60C 2019/008 . Venting means, e.g. for expelling entrapped air

B60C 2200/00 Tyres specially adapted for particular applications

- B60C 2200/02 . for aircrafts
- B60C 2200/04 . for road vehicles, e.g. passenger cars
- B60C 2200/06 . for heavy duty vehicles
- B60C 2200/065 . . for construction vehicles
- B60C 2200/08 . for agricultural vehicles
- B60C 2200/10 . for motorcycles, scooters or the like
- B60C 2200/12 . for bicycles
- B60C 2200/14 . for off-road use